Acquisition and Scheduling of Balancing Reserve Capacity – Long-Term, Preschedule, & Day-Ahead Markets

Purpose

BPA was asked for an outline of the potential costs and hurdles associated with relying on the daily and/or real-time energy markets for the acquisition of third party balancing reserve capacity. This paper will provide background information regarding the existing processes for third party acquisitions, the current thinking regarding preschedule capacity acquisitions, as well as the possible difficulties with relying on day-ahead or shorter-term capacity markets.

Balancing Reserve Requirements

The Bonneville Power Administration determined that the Federal Columbia River Power System (FCRPS) could, subject to non-power requirements, supply 900 MW of incremental and 1100 MW of decremental balancing reserves for the purpose of balancing wind and thermal generation and load within the BPA Balancing Area Authority (BAA) annually. BPA will attempt to acquire balancing reserve capacity needs in excess of this amount from third party suppliers.

Per the terms of the BP-14 Generation Inputs Rate Case Settlement, the 900 MW of incremental capacity is an upper limit for base service from the FCRPS during the two year period; at times reductions to this amount may be necessary. The magnitude of these reductions is dependent on a number of factors, including water conditions, generation, and transmission availability.

For balancing reserve capacity in excess of 900 MW, the modeling forecasts from the Settlement are currently being utilized. When these modeling forecasts predict that balancing reserves in excess of 900 MW are required, or when the FCRPS is unable to provide 900 MW of balancing reserves, BPA will attempt to acquire the difference from third party suppliers.

Acquisition and Term

When purchasing balancing reserve capacity to supplement the 900 MW available, to date BPA has utilized monthly or quarterly forward markets, not the preschedule, day-ahead or within-day markets. This timing decision is based on a combination of staffing limitations associated with a day-ahead process, an effort to time acquisition attempts to maximize the availability of supply, and the general lack of a sufficiently robust day-ahead and shorter-term market for capacity products in the NW.

Using a Request for Offer (RFO), PS requests offers from prequalified suppliers to provide the required capacity. After assessing the resulting offers, the offer that represents the best value to the BAA is selected.

Forecasting

Each business day, PS performs a number of analyses which determine the amount of energy that needs to be bought or sold in order to achieve the operational objectives of the FCRPS. These studies include forecasts of a number of input parameters which may limit the flexibility of the FCRPS to provide balancing reserves, such as stream flows, load, contract demand, unit outages and FCRPS operational objectives (flood control, Biological Opinion, irrigation, navigation, etc.). In addition to these forecasts, consideration is given to the uncertainty of each of these input parameters when determining the inventory that needs to be bought or sold.

In conditions when there is a significantly limited amount of operational flexibility and limited depth in the energy market, to meet the operational objectives of the FCRPS it may be necessary to limit the amount of balancing reserves that can be supplied. Under these conditions, BPA will attempt to acquire replacement balancing reserves capacity.

PS holds a daily meeting at 1400 PST, where a forecast for the next two-to-three weeks is presented. This analysis is used by the Trading Floor in determining the marketing strategy necessary to meet the operational objectives of the FCRPS. The sales or acquisitions that result from this marketing strategy currently take place within the preschedule period.

Preschedule Period – 5-Day Process

Preschedule energy trading is generally completed by 1000 PST on a given business day, based upon the previous business day's marketing strategy analysis.

BPA (along with the rest of the NW) utilizes the WECC 5-day preschedule calendar, with preschedule personnel present only during the standard 5-day work week. The following table shows the timing of these activities:

Day of Analysis	Day of Trading/Scheduling	Day of Delivery
Friday	Monday	Tuesday
Monday	Tuesday	Wednesday
Tuesday	Wednesday	Thursday
Wednesday	Thursday	Friday/Saturday
Thursday	Friday	Sunday/Monday

NERC holidays and the start of a new month introduce additional delays between the day of analysis and the day of delivery. For example, the Thanksgiving holiday requires that market analysis is completed on the Tuesday prior to Thanksgiving for trading on Wednesday, for energy delivery the following Monday; six days later.

Capacity Purchases within the Preschedule Period

BPA is currently developing the processes needed to begin attempting to acquire third party balancing reserve capacity in the preschedule period. Using the table above for reference, for these purchases BPA's current thinking is that PS will assess the need to reduce reserves supplied by the FCRPS at the 1400 PST meeting, on the Day of Analysis. Once determined, this information will be communicated to TS.

On that same Day of Analysis, TS will use this information to determine if the acquisition of balancing reserve capacity is necessary. If so, TS will create a PO and transmit it to PS, communicating this need, prior to the close of business that same day. PS will then attempt to acquire the requested reserves on the Day of Trading for the Day(s) of Delivery.

Day-Ahead Scheduling Challenges

Moving to a 7-day preschedule process (day-ahead) may shorten the time horizon between available forecast information and the day of delivery. Whether this information would result in reduced reserve requirements, however, depends on the scheduling behavior of the parties making use of those reserves. Absent a change to committed scheduling, a reduced time horizon would not result in reduced purchases.

Additionally, after years of consideration and study, the majority of the utilities within WECC do not utilize day-ahead scheduling functions; a number of California utilities are the only market participants within WECC that currently schedule in the day-ahead window. All others utilize the same 5-day preschedule window as BPA. As a result, there is no active, liquid day-ahead market outside of the standard preschedule days. Moving to a day-ahead scheduling paradigm would require that BPA's market and system analysis, forecasted need for reserves, purchase order development and authorization, and acquisition activity all take place not on the current Monday-Friday work week, but on a daily basis; 365 days a year. This would require staffing for these business activities outside of the current Monday-Friday work week. Specifically:

> "[Prescheduling seven days a week] would likely require significant and potentially costly increases in staffing or contractual resources and other fundamental changes in the market. If prescheduling were to become a seven-day a week process, it follows that power trading would need to become a seven-day a week process as well. Without natural gas changing to the same seven-day nomination/trading process, the concept of power prescheduling on a seven-day calendar could increase the disconnect that exists today. Some members believe that without concrete evidence of a significantly positive impact on reliability or economics, the case for change from status quo is very difficult to make, i.e., if companies are being asked to spend more dollars for pre-scheduling resources (either added personnel or contract dollars), there may need to be a clear-cut benefit to change."[i]

In application, for BPA to acquire capacity on a day-ahead or shorter-term time basis would require, at a minimum, that the following functions to take place 7 days a week, in some cases 24-hours a day:

- Daily process to update FCRPS availability to determine if PS needs to reduce planned reserves.
- Daily reserve requirement studies (R3T) from TS.

- Upon identifying additional need through study, TS authorization and communication of the required PO to PS (several hours' notice required).
- Identification of staff to attempt to acquire balancing reserve capacity specified in daily PO.
- Once acquired, PS would then be tasked with determining where to stack the deployment within the FCRPS response, based on the total cost of the resource (energy and capacity).

Conclusion

Moving acquisition of reserves to a timeframe shorter than the WECC 5-day preschedule calendar requires a considerable staffing commitment from BPA, and likely from a number from other NW entities as well. In addition to this added cost, BPA has concerns about the liquidity of such markets. However, once BPA establishes the pool of prequalified resources that are available in the preschedule period, it will be in a better position to assess the costs and benefits of purchasing on a shorter-term basis.

[i] WECC Prescheduling Evaluation Task Force (PETF) Final Report.